

# **CALFED Bay-Delta Program**

## **Ecosystem Restoration Program --Water User Fee Options**

### **Working Draft**

**Background:** The Finance Plan established a \$150 million annual funding target for ERP and put forward the following cost allocation:

- State 30%
- Federal 30%
- Water User 30%  
Includes CVP Restoration Fund payments (\$20mill/yr) and new water user fee from non-CVP users (\$25 mill/yr)
- Local Grant Match 10%

The basis for this cost allocation primarily comes from two sources. First, it is consistent with the percentage allocation of ERP costs discussed in the Record of Decision. Second, of the various ERP cost allocations considered during the development of the 10-Year Finance Plan, this one is closest to the proportional benefits-based cost allocation presented in the Draft Finance Options Report. It is also worth noting that an independent assessment of ERP costs and benefits to water users done by Metropolitan Water District and reviewed by other water user stakeholders also concluded that an allocation of 20-30% of ERP costs to water users would be consistent with expected water user benefits.

The water user share of \$45 million per year will be met using revenue from the CVP RF (\$20 million) and a new water user fee (\$25 million). Water users already contributing to the CVP RF would not be subject to the new fee. It would only be assessed on water users that do not currently pay into the CVP RF.

**Fee Options:** This paper presents several fee structures to fund the water user share of the ERP costs. Quantitative information for three fee options is presented

1. Fees based on water diversions
2. Fees based on reservoir storage capacity
3. Fees based on both water diversions and reservoir storage capacity

Each fee option is presented as an example of how such fees could be structured. However, the dollar amounts may change following a more in-depth review by Authority staff, CALFED agencies, and stakeholders.

Each fee alternative is summarized with respect to:

- Expected overall revenue
- Fee levels by water user class
- Allocation of cost by water user class

- Potential rate impact by water user class

The pros and cons of each fee alternative is summarized with regard to:

- Adherence to benefits-based approach
- Administrative feasibility and cost
- Ability to improve resource efficiency
- Social equity

**Starting Assumptions:** The annual revenue target for water users is \$45 million. It is assumed that revenue from the CVP RF will cover \$20 million of this. New fees paid by water users not already paying into the CVP RF will need to generate an additional \$25 million annually. Water users potentially subject to new fees include SWP contractors, CVP exchange contractors, CVP settlement contractors, and non-project water users (which includes non-CVP hydropower generators for some fee options).

**Water User Classes:** The analysis of fee options differentiates water users by type of use (agricultural, urban, hydropower), diversion point (Sacramento Valley, In-Delta, Delta Export, San Joaquin Valley, and Upstream of Delta), and project (SWP, CVP, Non Project). ERP fee alternatives may include all users potentially subject to new fees or may exclude some of these users from the fee structure for one reason or another.

**Data Sources:** Table 1 lists average annual diversions by water user class. The average reflects the frequency of dry, normal, and wet years in the hydrologic record. This data was used to compute the diversion fee level and revenue for each diversion fee option. Diversion data come from the Department of Water Resources. Table 2 lists in aggregate the storage capacities for the 33 largest reservoirs impounding waters that drain through the Delta. A table attached to the end of this paper provides the capacities for each reservoir included in the analysis. These capacities are used to compute storage-based fees. The data come from Department of Water Resources.

### ***Fees Based on Water Diversions***

Four variations of a diversion-based fee were developed:

1. Uniform per acre-foot diversion fee.
2. Differentiated by export versus non export water users
3. Differentiated by urban versus agricultural water users
4. Differentiated by export versus non-export and urban versus agricultural water users.

The fee model used the following assumptions and constraints to generate the fees and revenue estimates discussed below.

### *Revenue Neutrality*

- Each variation of a diversion fee is designed to generate \$25 million of fee revenue.
- Revenue estimates do not account for potential demand responses to higher diversion fee costs. These potential responses are addressed in the discussion of diversion fees.

### *Fee Multipliers*

- For variations that differentiate urban and agricultural fees, the urban fee is set to twice the agricultural fee. This follows the precedent set by CVP RF fees.
- For variations that differentiate export and non-export water uses, the fee on export uses is twice the fee on non-export uses. This assumption was a starting estimate that will require further analysis.
- For variations that differentiate by both type of use and export, the two fee multipliers determine the fee for each user class. The lowest fee is paid by non-export agricultural diversions. The fee for export agricultural diversions is twice this base amount, as is the fee for non-export urban use. The fee for export urban use is four times the base amount.

### *Revenue Collection*

The percent of diversions for which it is assumed fees can be collected is as follows:

- 100% of CVP and SWP diversions
- 80% of non-project urban diversions
- 60% of non-project agricultural diversions

These assumptions were adopted because it is unlikely that the state will be able to successfully levy and collect fees on all diversions. Small agricultural diversions are likely to present the greatest collection challenge, followed by small urban diversions (including self-supplied residences and businesses).

### *CVP RF*

The analysis assumes that CVP RF contributions to ERP average \$20 million per year. It is important to keep in mind, however, that CVP RF revenues fluctuate from year-to-year and the Bureau of Reclamation has discretion with regard to the amount of CVP RF dedicated to ERP purposes.

### *Diversion-Based Fee Estimates*

Table 1 summarizes the diversion fee (\$/AF of diversion) for each variation and the fees paid by each water user class. Fees for agricultural diversions depend on type of diversion. Fees for non-export diversions range between \$1.32/AF and \$2.12/AF. Fees for export diversions range between \$1.81/AF and \$3.24/AF. Fees for urban diversions

also depend on type of diversion. For non-export urban diversions, fees range between \$1.62/AF and \$3.62/AF, while fees for export urban diversions range between \$2.12/AF and \$5.29/AF.

Figures 1 through 4 show the average impact on rates by major water user class. Baseline rates reflect the cost at the diversion point or for CVP and SWP project water and do not include the costs for treatment and distribution.<sup>1</sup> Tables with the detail supporting these figures are provided at the end of this paper.

### ***Discussion of Diversion-Based Fees***

- *Adherence to Benefits-Based Approach*

The cost share (30%) proposed in the Finance Plan recognizes the significant benefits expected to accrue to the water users from the ERP as well as the impacts these diversions have on the ecosystem. The benefits primarily take the form of reduced risk of future ESA-related regulatory actions that could affect the timing and amount of diversion from the Delta and its tributaries. Risk exposure is partly a function of the amount of diversion, the point of diversion, and water rights seniority.

Risk exposure generally increases with the amount of diversion. Large diverters are more likely to be closely regulated and impacted by those regulations than small diverters. A diversion fee, which allocates ERP costs in proportion to the amount diverted, would be generally consistent with a benefits-based approach to cost allocation among water users.

A second question is whether a diversion fee should be differentiated across water users. A uniform fee would be appropriate if the amount of benefit or impact per unit of diversion did not vary much across water users. This would be true if all water users were equally exposed to future ESA-related regulatory actions, which is unlikely to be the case. Junior water right holders face more risk than senior water right holders. This suggests that a disproportionate share of ERP water user benefits will accrue to water users with junior water rights. A diversion fee roughly differentiated by water rights seniority would more closely adhere to a benefits-based approach than a uniform diversion fee. Additionally, water users diverting out of the Delta may be more closely regulated than those diverting above the Delta.

Of the diversion fee options considered, Options 2 and 4, which differentiate fees between Delta exporters and non-exporters, would most closely correlate the fee to differences in benefits due to water rights seniority and point of diversion. Water rights held by CVP and SWP are generally junior to rights held by in-basin and upstream diverters. There are exceptions to this, but in general this is the case. Historically, Delta exporters have also faced the greatest amount of regulatory risk.

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<sup>1</sup> Non-project agricultural diversions were assumed to average \$15/AF in the Sacramento Valley and Delta and \$25/AF in the San Joaquin Valley. Non-project urban diversions were assumed to average \$150/AF for up-stream (primarily EBMUD and SFPUC) diversions and \$50/AF for Delta diversions.

Options 2 and 4 apply a fee multiple of 2 to CVP and SWP export diversions. While this accounts for the potential difference in benefits received, the multiple was an estimate and would require further evaluation. The Authority currently does not have sufficient information to quantitatively determine the multiple.

- *Administrative feasibility and cost*

Administration and collection of diversion fees from the CVP and SWP would be straightforward and could be accomplished within the existing revenue collection systems for the two projects. For the CVP a new diversion fee would apply to exchange and settlement contract water only. CVP diversions subject to the CVP RF would not be assessed a new fee.

Collecting fees from non-project diverters would be more challenging. While most, if not all, medium and large agricultural and urban districts subject to fees are known to the state through their SWRCB water rights filings and measure their diversions, there are hundreds, if not thousands, of small, mostly agricultural, diverters that the state would need to collect from. Many of these small diversions may not be accurately measured. Administrative systems for collecting fees from these diverters would need to be developed. The SWRCB's recently adopted water rights fee program could be used to identify smaller water right holders subject to a diversion fee. However, this program does not measure actual diversions, so there would still be the measurement problem to address.<sup>2</sup>

The fee levels and revenue estimates in Table 1 assume the state would not be able to collect fees on all small diversions. They assume the state would successfully collect fees from 80% of non-project urban diversions and 60% of non-project agricultural diversions.

- *Ability to Improve Resource Efficiency*

It has long been argued that water costs in California understate the full social cost of water development and that this results in inefficient use of developed water resources. The overall level of consumption is inefficient because the benefits derived at the margin of use are less than the costs to provide water for these uses. If this is true society could more productively employ some of its resources dedicated to water development in alternative uses. A diversion fee would increase the marginal cost of water to users. If the fee properly reflected unaccounted for costs of water development, such as costs to the environment, it would help to eliminate inefficient use of the resource. In short, diversion fees have the potential to internalize costs of water development that historically have not been incorporated into water prices.

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<sup>2</sup> Implementation of BDA's Staff Proposal on Appropriate Agricultural and Urban Water Use Measurement, adopted by BDA in April 2004, would address some of these measurement problems. Alternatively, agricultural fees for diversions that cannot be measured could be based on estimates of crop applied water or crop consumptive use of water. BDA staff is currently exploring the feasibility of this latter approach.

Other types of fees may be less effective at doing this. For example, a connection fee would not be reflected in water prices and would be largely divorced from decisions about consumption, at least at the margin. Once the connection fee is paid the fee is a sunk cost. A user's marginal cost of water is thereafter unaffected. Likewise, a fee based on the purpose and distribution of ERP projects would not affect water use decisions unless these fees were transmitted through diversion prices. If the fees were paid in lump sums, they would be largely irrelevant to consumption decisions at the margin.

However, there is no guarantee that a diversion fee would improve resource efficiency. Diversion fees are equally capable of worsening resource efficiency if they are poorly designed. Fees set too high could result in under-consumption of the resource, which, from an economic standpoint, is just as inefficient as over-consumption. For example, higher costs for surface water could cause some water users to increase groundwater pumping, which could exacerbate groundwater overdraft in some regions.<sup>3</sup>

- *Revenue Generation*

Fees prompting a substitution response will fall short of the annual revenue target of \$25 million. The extent of the shortfall will depend on the demand elasticities for water in different uses. Under normal conditions consumers demand more of a good at lower prices and less at higher prices. The elasticity of demand measures the strength of this response. Most empirical studies have found the demand for water to be very inelastic – meaning higher prices prompt some substitution response, but not much. Long-run estimates of demand elasticity for urban water uses generally range between -0.1 and -0.2, which means a 10% increase in the cost of urban water use would decrease demand by one to two percent. Likewise, estimates of demand elasticity for agricultural uses are also low. The median estimate of elasticity from a review of 53 irrigation demand studies was -0.22. In aggregate, we estimate the fees presented here would increase diversion costs by roughly 3%. With a long-run demand elasticity of -0.2, the hypothesized fees would decrease demand by 0.6%, in which case fee revenue would total \$24.85 million rather than \$25 million. This estimate probably understates the response that should be expected. This is because demand elasticities reflect changes in the use of water and not changes in the source of water. If users are able to substitute groundwater for surface water at low cost, the impact of higher diversion costs could be greater than suggested by empirical estimates of demand elasticity.

- *Social Equity*

Looking at the percentage change in water diversion cost, agricultural water users would be more sharply affected than urban users under any of the four diversion fee options. Figure 2 shows that diversion costs for agricultural users would increase by five to twenty

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<sup>3</sup> If the fee results in the marginal cost of surface water exceeding the marginal cost of groundwater, users will substitute groundwater for surface water. Substitution will continue until groundwater costs rise to the level of surface water costs. Thus users will switch to groundwater until groundwater levels drop enough drive up pumping costs to the level of surface water costs.

percent, while Figure 4 shows an increase for urban users of one to three percent. Option 4 does the best job of reducing the differential in rate impacts between agricultural and urban users, though the differential, in percentage terms, remains significant.

These differences do not necessarily point to an inequity. Primarily, they reflect the fact that diversion costs for urban users are much higher to begin with. In dollar amounts, urban users pay the same or higher fees as their agricultural counterparts under all four fee options. The differences do suggest, however, that adjustment costs would be higher in the agricultural sector. Increases in diversion costs of five to twenty percent could affect farming profits and the viability of some farming operations. Ultimately, the higher costs would impact agricultural land values to some degree and cause resources to shift out of marginal farming operations.<sup>4</sup> Urban users would also face higher costs and marginal uses of the resource would also be affected. However, these impacts would be spread over many more users. In the agricultural sector, impacts will be concentrated. In the urban sector they will be diffuse.

Fees that do not follow the distribution of benefits would be more inequitable than those that do. As discussed previously, fees that differentiate between export and non-export users may better reflect the distribution of expected ERP benefits. This suggests that from the standpoint of equity Options 2 and 4 should be preferred to Options 1 and 3.

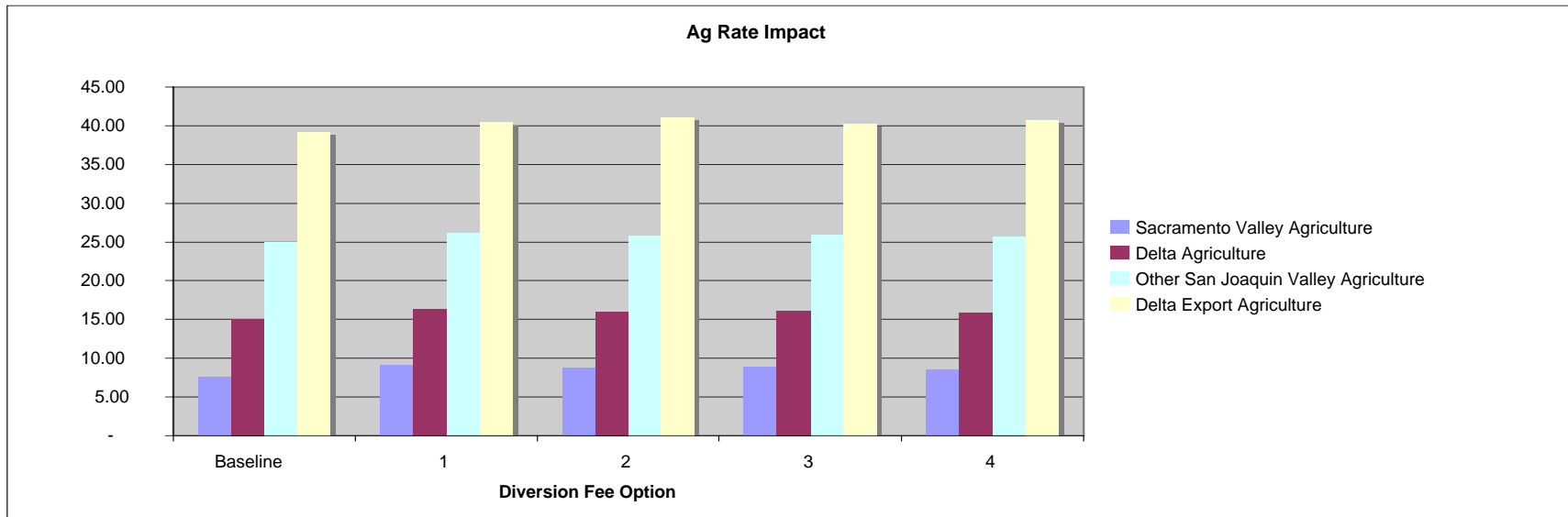
A final consideration with regard to equity is whether the fees proposed under the four options are broadly consistent with fees paid by CVP contractors into the CVP RF. CVP RF charges under CVPIA 3407(d) are approximately \$8/AF for agricultural contractors and \$16/AF for M&I contractors. The FY2005 revenue forecast from these fees is about \$46 million. If \$20 million of these revenues contribute to the ERP, then agricultural and M&I CVP contractors are paying roughly \$3.48/AF and \$6.96/AF, respectively, to support ERP projects. The total and proportional Restoration Fund rates exceed any of the rates under the four diversion fee options. The rates proposed for urban and agricultural exports under Option 4 are about 75% of the rates CVP contractors would pay to support ERP.

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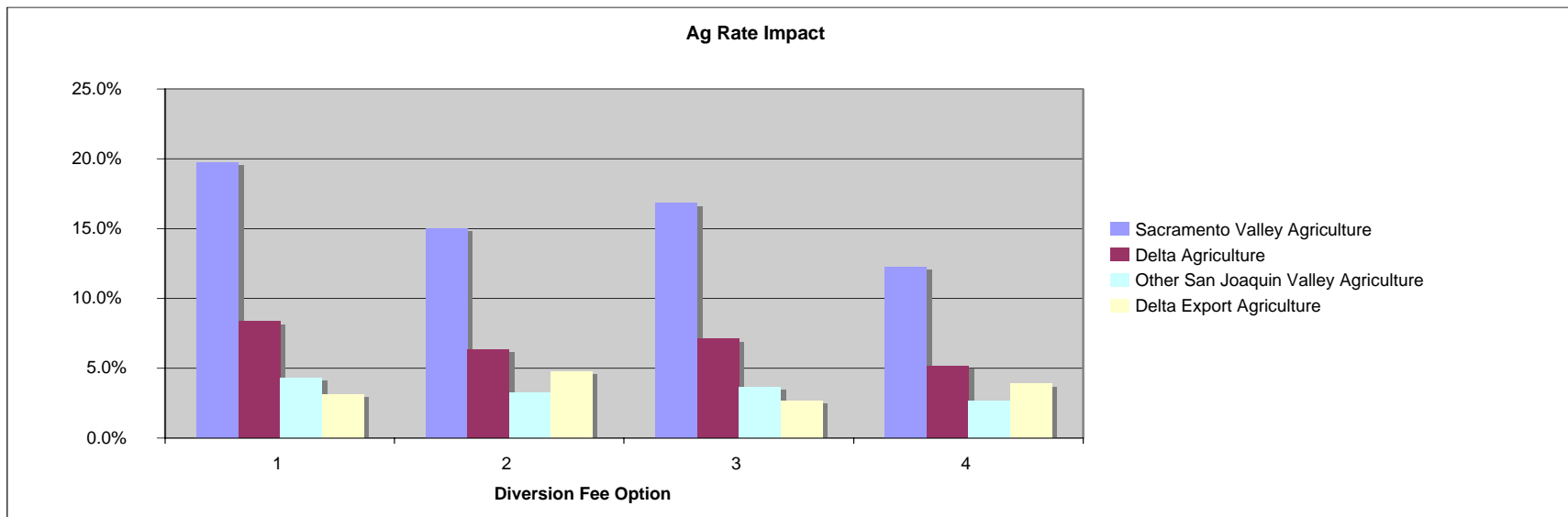
<sup>4</sup> From an economic efficiency standpoint, this is exactly what needs to happen – in both the agricultural and urban sectors -- in order to eliminate inefficient consumption of the resource at the margin. Protecting resource users from these impacts would perpetuate these inefficiencies.

**Table 1. ERP Water User Fee Options Based on Diversions**

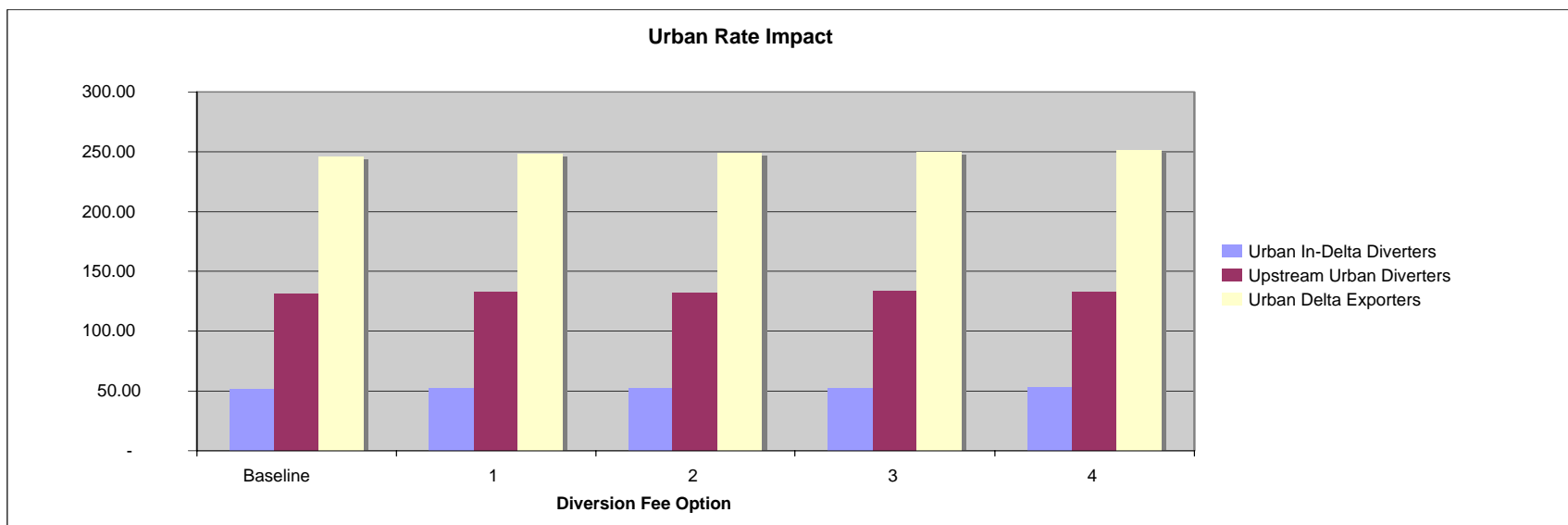
Water Users in Beneficiary Group	Estimated TAF Diversion by Water User to Estimate Fee Revenue	Diversion Fee Option (\$/AF)				Revenue by Diversion Fee Option (\$1,000)			
		1	2	3	4	1	2	3	4
<b>Sacramento Valley Agriculture</b>	<b>5,159</b>	<b>2.12</b>	<b>1.62</b>	<b>1.81</b>	<b>1.32</b>	<b>7,748</b>	<b>5,917</b>	<b>6,604</b>	<b>4,829</b>
DWR SWP Sac V	16					35	27	30	22
SWP Ag settlement contracts	1,005					2,133	1,629	1,818	1,329
CVP Ag settlement contracts Sac	1,424					3,022	2,308	2,576	1,883
Ag Nonproject *	2,009					2,558	1,954	2,181	1,595
CVP Ag contracts	704	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Delta Agriculture</b>	<b>1,219</b>	<b>2.12</b>	<b>1.62</b>	<b>1.81</b>	<b>1.32</b>	<b>1,527</b>	<b>1,166</b>	<b>1,302</b>	<b>952</b>
Ag Nonproject Sac V Delta *	490					624	476	532	389
Ag Nonproject SJV Delta *	709					903	690	770	563
CVP Ag contracts	20	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Delta Export Agriculture</b>	<b>3,805</b>	<b>2.12</b>	<b>3.24</b>	<b>1.81</b>	<b>2.65</b>	<b>4,686</b>	<b>7,157</b>	<b>3,994</b>	<b>5,841</b>
SWP Ag Project	1,331					2,824	4,313	2,407	3,520
CVP Ag exchange contracts	720					1,527	2,333	1,302	1,904
CVP Ag settlement contracts SJV	158					334	511	285	417
CVP Ag contracts	1,597	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Other San Joaquin Valley Agriculture</b>	<b>6,258</b>	<b>2.12</b>	<b>1.62</b>	<b>1.81</b>	<b>1.32</b>	<b>6,713</b>	<b>5,127</b>	<b>5,722</b>	<b>4,184</b>
Ag Nonproject *	5,272					6,713	5,127	5,722	4,184
CVP Ag contracts	986	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Upstream Urban Diverters</b>	<b>824</b>	<b>2.12</b>	<b>1.62</b>	<b>3.62</b>	<b>2.65</b>	<b>1,154</b>	<b>881</b>	<b>1,968</b>	<b>1,439</b>
CVP M&I settlement contracts Sac	30					65	49	110	80
M&I Nonproject **	642					1,090	832	1,858	1,358
CVP M&I contract Sac	152	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
CVP M&I contract Friant	44	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Urban Delta Exporters</b>	<b>1,519</b>	<b>2.12</b>	<b>3.24</b>	<b>3.62</b>	<b>5.29</b>	<b>3,050</b>	<b>4,658</b>	<b>5,200</b>	<b>7,603</b>
SWP M&I Project	1,362					2,891	4,415	4,929	7,207
CVP M&I exchange contracts	71					151	231	257	376
CVP M&I settlement contracts SJV	4					8	12	14	20
CVP M&I contracts	82	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Urban In-Delta Diverters</b>	<b>191</b>	<b>2.12</b>	<b>1.62</b>	<b>3.62</b>	<b>2.65</b>	<b>123</b>	<b>94</b>	<b>210</b>	<b>153</b>
Delta M&I (not CCWD) **	72					123	94	210	153
CVP M&I contract (CCWD)	118	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Total, Bay-Delta System</b>	<b>18,975</b>					<b>25,000</b>	<b>25,000</b>	<b>25,000</b>	<b>25,000</b>
*Revenue estimate assumes fees collected on 60% of diversions. **Revenue estimate assumes fees collected on 80% of diversions.									
Option 1: Uniform fee                      Option 2: Higher fee for exports                      Option 3: Higher fee for urban                      Option 4: Higher fee for exports and urban									



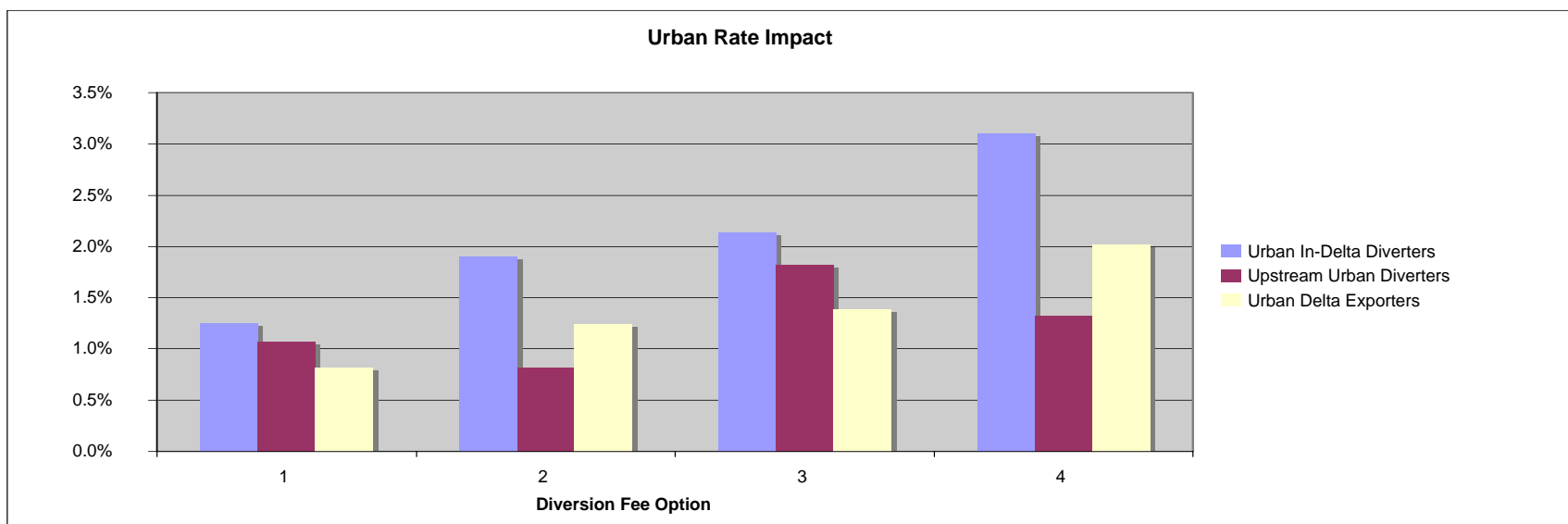
**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

## ***Fees Based on Storage Capacity***

This option would charge owners of surface water storage facilities based on the amount of storage capacity. All major facilities that store water from Bay-Delta watersheds would pay the fee. This option differs from a diversion fee option in that a variety of types of users of storage space would pay. Some storage facilities are used primarily for water supply, but some facilities are operated for flood control, hydropower, recreation, and other purposes. All persons who benefit from the facilities, not just water users, would probably pay. It would be up to each storage owner to determine how fee costs would be recovered from each of the purposes.

The unit charge (\$/AF storage) could be adjusted to obtain any desired revenue, subject to ability to pay. Ability to pay, in this context, means that at sufficiently high fee levels some storage users might not be induced to pay by any reasonable incentives.

Revenues would also depend on the size of facilities covered under the fee. There are thousands of small storage facilities in the state. It would be impractical to try to collect fees from a large number of small storage facilities, and a decision regarding the cut-off point for facilities covered by the fee would be required.

Metropolitan Water District of Southern California developed an example where only large storage facilities are included. Storage capacities for 33 major reservoirs are used. Two alternative actions are evaluated. In one, \$45 million is raised and all storage capacity pays the same fee. In the second, CVP facilities must contribute \$20 million and non-CVP facilities contribute \$25 million per year.

Results are summarized in Table 2 below. In either action, the CVP pays about \$20 million per year, the SWP pays about \$7 million, and the “Other-Local” category pays about \$14.5 million per year. Table 3 lists the storage facilities included in “Other-Local.” The fees amount to \$1.94/AF of storage capacity.

**Table 2. Results of Metropolitan's Analyses, Fees Allocated According to Share of Storage Space**

			CVP pays \$20 Mil, All Others Pays \$25 Mil		All Storage Pays the Same Fee	
Storage Operator	# of Reservoirs	MAF Capacity	\$ millions	\$/AF	\$ millions	\$/AF
SWP	2	3.64	\$7.1	\$1.95	\$7.0	\$1.93
USBR/CVP	8	10.46	\$20.0	\$1.91	\$20.2	\$1.93
USCE	5	1.68	\$3.3	\$1.95	\$3.3	\$1.93
OTHER-LOCAL	18	7.48	\$14.6	\$1.95	\$14.5	\$1.93
TOTAL	33	23.27	\$45.0	\$1.93	\$45.0	\$1.93

**Table 3. Other-Local Storage Facilities Included in Metropolitan's Analyses, Fees Allocated According to Share of Storage Space**

Reservoir	Owner	Stream	Capacity (AF)	Share of Capacity
Almanor	PG&E	North Fork Feather	1,308,000	17.5%
Bucks Lake	PG&E	Bucks Creek	103,000	1.4%
Salt Springs	PG&E	N. F. Mokelumne	141,900	1.9%
Little Grass Valley	SFWPA	South Fork Feather	93,010	1.2%
French Meadows	PCWA	M. F. American	136,000	1.8%
Hell Hole	PCWA	Rubicon River	208,400	2.8%
Loon Lake	SMUD	Gerle Creek	76,500	1.0%
Union Valley	SMUD	Silver Creek	230,000	3.1%
Indian Valley	YCFCWCD	N. F. Cache Crk	300,000	4.0%
Clear Lake	YCFCWCD	Cache Creek	313,000	4.2%
Pardee	EBMUD	Mokelumne River	210,000	2.8%
Camanche	EBMUD	Mokelumne River	412,120	5.5%
Lake Lloyd (Cherry)	SF	Cherry Ck/Tuolumne	274,300	3.7%
Hetch Hetchy	SF	Tuolumne River	360,000	4.8%
New Don Pedro	TID	Tuolumne River	2,030,000	27.1%
Lake McClure	Merced Co	Merced River	1,024,600	13.7%
Edison	SCE	Mono Creek	125,000	1.7%
Shaver	SCE	Stevenson Creek	135,400	1.8%
		TOTAL	7,481,230	100.0%

The breakdown indicates that, in this example, relatively large shares of the \$14.5 million would be paid by TID (27.1%), P&E (20.8%), and Merced County (13.7%). Note that inclusion of hydropower facilities causes the distribution of costs within the “other” category to differ significantly from diversion-based fees.

### *Fee levels by water user class*

The amount of fee paid by water user class cannot be determined, even for the example, because many storage facilities are used for multiple purposes. It would be up to each owner/operator to determine how fee costs would be recovered from each of the purposes. This also means that rate impacts cannot be evaluated without a better understanding of how storage operators might allocate these fees. However, some general findings for each water user class are possible.

- *Sacramento Valley Agriculture*

Most water users under this water user class do not own surface water storage. There are some small facilities such as Black Butte Lake and Stony Gorge that might contribute. Lake Berryessa, if included, would be an important contributor. CVP project agriculture, primarily in the Tehama Colusa service area, would continue to contribute through the CVP RF. Therefore the new contribution by this group would probably be small. Many water users would pay no fee.

- *Delta Agriculture*

This group owns no significant surface storage, so their fee level would be zero to minimal.

- *Delta Export Agriculture*

The share of new fees paid by Delta Export Agriculture would depend on how much of the storage fee is allocated to agricultural water use, municipal water use, and other storage purposes. SWP Ag Project users would contribute based primarily on storage capacity at Oroville. The total SWP contribution of \$7 million would be split between municipal and agricultural water and other SWP users. CVP Ag contracts would continue to contribute through the CVP RF. CVP settlement and exchange users would probably not contribute.

- *Other SJV Agriculture*

This group would contribute substantially in proportion to surface water storage facilities on the Eastside San Joaquin, but shares paid by hydropower, municipal and other storage users might limit their dollar contribution. CVP agriculture served by the Friant and Madera units already contributes through fees required by the CVPIA. Many water users do not use storage and therefore would pay no fee.

- *Upstream Urban Diverters*

This group would contribute substantial new funds through eastside reservoirs owned by EBMUD and the City and County of San Francisco. Metropolitan's analysis suggests that these two users would contribute 16.8% of the "Other-local" category or \$2.4 million per

year. This share could vary depending on the amount of total storage capacity included as a basis for the fee.

- *Urban Delta Exporters*

This group would contribute primarily through reservoir space owned by the SWP. The total SWP contribution of \$7 million would be split between municipal, agricultural and other SWP users.

Some CVP urban use would be included. This group already contributes through the CVP RF. The analysis by Metropolitan and precedent suggest that, even if the restoration fund were replaced by a storage-based fee, the amount of cost paid by the CVP would not change substantially.

- *CVP M&I CCWD*

Any adjustment to current restoration payments would probably be small.

### ***Discussion of Storage-Based Fees***

- *Adherence to benefits-based approach*

The water user cost share (30%) proposed in the Finance Plan recognizes the significant benefits expected to accrue to the water users from the ERP as well as the impacts diversions or storage have on the ecosystem. This option is based on a theory that storage users benefit from the ERP and impact the ecosystem, and should pay based on the capacity of water storage. Water storage is presumed to be a proxy for benefits and impacts. The benefits might be avoided costs of complying with environmental laws involving amount of water stored, water yield of the watershed blocked by dams, and for habitat blocked or inundated. This approach embodies the idea that all persons who capture surface water in surface storage facilities should contribute regardless of how they use the water. Storage space for flood control, hydropower, emergency storage and all other uses would pay.

Implicit in this option is the idea that persons who divert and use natural flows – water that has not been stored – do not benefit or impact from the ERP. Therefore, they do not pay. For this option to be consistent with a benefits-based approach there must be consensus that these water users do not contribute to Bay-Delta problems, or they are not responsible for them, or they have already contributed their fair share.

- *Administrative feasibility and cost*

This option would be highly feasible in terms of simplicity of administration. Storage capacities are known with a relative high degree of certainty. The costs of administration would increase with the number of smaller storage facilities included in the fee basis. At

some point, the incremental costs of collecting from small facilities would exceed the incremental fee revenue, and such small facilities should not be included in the fee basis.

There are some issues about the feasibility of this option in relation to many other environmental laws and permitting for storage facilities. In particular, FERC typically requires many environmental improvements as part of their storage licensing. Possibly, the storage fees would have to be included as part of future license requirements.

- *Ability to improve resource efficiency*

This option would do little to nothing to improve resource efficiency because there is no additional, variable fee imposed on resource use. This finding presumes that resource prices are already too low, so some additional price would improve efficiency. Possibly, the new fee would discourage construction of new storage facilities.

- *Revenue Generation*

This option would provide a constant source of revenue. Unlike a diversion fee, price substitution effects and variations in annual water use caused by weather or the economy would not affect revenue generated by this fee structure.

- *Social equity*

The distribution of costs of fees over income groups cannot be determined because each storage owner would determine the allocation of costs among storage users.

This option could be viewed as more equitable in that all users of water storage facilities, not just water users, must contribute. On the other hand, persons who divert Bay-Delta water but do not store would not contribute.

- *Key Uncertainties*

A key uncertainty involves interactions with other regulatory requirements for storage facilities – notably FERC relicensing of storage facilities producing hydropower.

### ***Fees Based on Diversions & Storage Capacity***

The last option presented combines the first two approaches. Half of the revenue requirement is recovered with a diversion fee and half with a storage fee. The resulting diversion and storage fees are shown in Tables 4 and 5, respectively. Because of the assumption that each fee would generate half of the \$25 million revenue requirement, the fee levels are simply 50% of those shown in Tables 1 and 2. As with the other options, water users already paying into the CVP RF would not be subject to these fees.

## *Discussion of Combined Diversion & Storage Fee*

- *Adherence to Benefits-Based Approach*

This option adopts the position that both diverters and storage users potentially benefit from the ERP and impact the ecosystem. The benefits would primarily be avoidance of more stringent regulation of storage and diversions to protect at-risk species and habitat and therefore more reliable and lower cost water supply and power generation than would be the case without the ERP. Water diverters with access to storage are presumed to benefit most and therefore would pay higher fees than water users that divert without storage (e.g. much of Sacramento Valley agriculture) or store water but don't divert offstream (e.g. hydropower, flood protection, and reservoir recreation). Whether the pattern of ERP benefits actually follows this implied distribution requires further analysis.

- *Administrative feasibility and cost*

Storage fees would be relatively easy to administer. Administration of diversion fees would face the same challenges discussed earlier. This example adopts the same revenue collection assumptions as before: namely, that revenue would be collected on 80% of non-project urban diversions and 60% of non-project agricultural diversions.

- *Ability to Improve Resource Efficiency*

If one accepts the premise that current diversion prices do not fully reflect the social costs of surface water development, then increasing diversion costs with a diversion fee could improve resource efficiency. This option would be less effective in this regard than relying only on a diversion fee but would be more effective than only relying on a storage fee.

- *Revenue Generation*

Revenue under this option would be more stable and predictable than under a diversion fee only, but less reliable than under a storage fee only. It provides a middle case between the storage fee and diversion fee options. Revenue risks caused by price substitution effects and variations in diversions caused by economic and weather variables would be lessened but not eliminated.

- *Social Equity*

This option identifies all water users impacting the Bay-Delta watershed as potential beneficiaries of the ERP. Unlike the diversion-fee-only option, which excludes hydropower, flood protection, and recreation, or the storage-fee-only option, which excludes diverters without storage, this option allocates ERP costs to all these users. If one accepts the premise that all of these users potentially gain from ERP actions, this option could be viewed as the most equitable of the three provided a consensus forms

around the division of water user costs among these various user groups. One of the challenges of this option with regard to fairness is the fact that some users will be subject to both fees while others will be subject to only one fee. If fee amounts do not adequately reflect at least in a general way the benefits accruing to these different groups, particularly those paying both fees could see this approach as inequitable.

**Table 4. ERP Diversion Fee With \$12.5 Million Revenue Requirement**

Water Users in Beneficiary Group	Estimated TAF Diversion by Water User to Estimate Fee Revenue	Diversion Fee Option (\$/AF)				Revenue by Diversion Fee Option (\$1,000)			
		1	2	3	4	1	2	3	4
Sacramento Valley Agriculture	5,159	1.06	0.81	0.90	0.66	3,874	2,958	3,302	2,414
DWR SWP Sac V	16					17	13	15	11
SWP Ag settlement contracts	1,005					1,066	814	909	665
CVP Ag settlement contracts Sac	1,424					1,511	1,154	1,288	942
Ag Nonproject *	2,009					1,279	977	1,090	797
CVP Ag contracts	704	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Delta Agriculture	1,219	1.06	0.81	0.90	0.66	763	583	651	476
Ag Nonproject Sac V Delta *	490					312	238	266	194
Ag Nonproject SJV Delta *	709					452	345	385	281
CVP Ag contracts	20	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Delta Export Agriculture	3,805	1.06	1.62	0.90	1.32	2,343	3,578	1,997	2,920
SWP Ag Project	1,331					1,412	2,157	1,204	1,760
CVP Ag exchange contracts	720					764	1,166	651	952
CVP Ag settlement contracts SJV	158					167	255	142	208
CVP Ag contracts	1,597	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Other San Joaquin Valley Agriculture	6,258	1.06	0.81	0.90	0.66	3,356	2,563	2,861	2,092
Ag Nonproject *	5,272					3,356	2,563	2,861	2,092
CVP Ag contracts	986	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Upstream Urban Diverters	824	1.06	0.81	1.81	1.32	577	441	984	719
CVP M&I settlement contracts Sac	30					32	25	55	40
M&I Nonproject **	642					545	416	929	679
CVP M&I contract Sac	152	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
CVP M&I contract Friant	44	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Urban Delta Exporters	1,519	1.06	1.62	1.81	2.65	1,525	2,329	2,600	3,802
SWP M&I Project	1,362					1,445	2,208	2,464	3,603
CVP M&I exchange contracts	71					75	115	129	188
CVP M&I settlement contracts SJV	4					4	6	7	10
CVP M&I contracts	82	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
Urban In-Delta Diverters	191	1.06	0.81	1.81	1.32	62	47	105	77
Delta M&I (not CCWD) **	72					62	47	105	77
CVP M&I contract (CCWD)	118	CVP RF	CVP RF	CVP RF	CVP RF	-	-	-	-
<b>Total, Bay-Delta System</b>	<b>18,975</b>					<b>12,500</b>	<b>12,500</b>	<b>12,500</b>	<b>12,500</b>
*Revenue estimate assumes fees collected on 60% of diversions.									
**Revenue estimate assumes fees collected on 80% of diversions.									
Option 1: Uniform fee                      Option 2: Higher fee for exports                      Option 3: Higher fee for urban                      Option 4: Higher fee for exports and urban									

**Table 5. Storage Fee With a \$12.5 Million Revenue Requirement**

<b>Storage Fee</b>	<b>\$1,000/Yr</b>	<b>Capacity</b>	<b>\$/AF</b>
SWP	3,555	3,642	0.98
TID	1,981	2,030	0.98
USCE	1,643	1,683	0.98
PG&E	1,516	1,553	0.98
Merced County	1,000	1,025	0.98
SF	619	634	0.98
EBMUD	607	622	0.98
YCFCWCD	598	613	0.98
PCWA	336	344	0.98
SMUD	299	307	0.98
SCE	254	260	0.98
SFWPA	91	93	0.98
USBR/CVP	-	10,459	-
<b>Revenue Generated (\$1,000)</b>	<b>12,500</b>	<b>23,266</b>	

## ***Summary of Allocated Costs Under Each Fee Option***

Table 6 summarizes how ERP costs allocated to water users would be divided among SWP, CVP, and non-project water users under each of the three fee options. ERP costs assigned to non-project water users are highest under the storage fee option and lowest under the diversion fee option. For the SWP, the situation is reversed. Fees are highest under the diversion fee option and lowest under the storage fee option. It is also important to remember that the mix of non-project water users is not the same between these two options. In the case of a diversion fee, non-project water users include diverters without storage, but exclude storage without diversions (e.g. hydropower, flood protection, and recreation). In the case of a storage fee, the opposite is the case. Only in the case of the combined storage and diversion fees does the non-project water user category include both diverters without storage and storage without diversions.

**Table 6. Summary of Division of Water User Costs**

<b>Diversion Fee Only (\$ millions)</b>				
<i>Diversion Fee Variation</i>				
Water User	1	2	3	4
SWP	7.9	10.4	9.2	12.1
CVP	20.0	20.0	20.0	20.0
CVP Settle/Exch	5.1	5.4	4.5	4.7
Non Project	12.0	9.2	11.3	8.2
Total	45.0	45.0	45.0	45.0
<b>Storage Fee Only (\$ millions)</b>				
Water User				
SWP	7.1			
CVP	20.0			
CVP Settle/Exch				
Non Project	17.9			
Total	45.0			
<b>Storage &amp; Diversion Combined Fees (\$millions)</b>				
<i>Diversion Fee Variation</i>				
Water User	1	2	3	4
SWP	7.5	8.7	8.1	9.6
CVP	20.0	20.0	20.0	20.0
CVP Settle/Exch	2.6	2.7	2.3	2.3
Non Project	15.0	13.5	14.6	13.1
Total	45.0	45.0	45.0	45.0

## *Data Tables Used to Compute Diversion and Storage Fees*

Water Users in Beneficiary Group	Estimated TAF Diversion by Water User to Estimate Fee Revenue	Baseline Unit Cost (\$/AF)	Baseline Diversion Cost (\$1,000)
Sacramento Valley Agriculture	5,159	7.61	39,240
DWR SWP Sac V	16	26.84	442
SWP Ag settlement contracts	1,005	0.46	466
CVP Ag settlement contracts Sac	1,424	-	-
Ag Nonproject *	2,009	15.00	30,139
CVP Ag contracts 1/	704	11.63	8,193
<b>Delta Agriculture</b>	<b>1,219</b>	<b>15.03</b>	<b>18,328</b>
Ag Nonproject Sac V Delta *	490	15.00	7,349
Ag Nonproject SJV Delta *	709	15.00	10,639
CVP Ag contracts	20	17.13	339
<b>Delta Export Agriculture</b>	<b>3,805</b>	<b>39.22</b>	<b>149,245</b>
SWP Ag Project	1,331	75.16	100,018
CVP Ag exchange contracts	720	-	-
CVP Ag settlement contracts SJV	158	-	-
CVP Ag contracts 3/	1,597	30.82	49,226
<b>Other San Joaquin Valley Agriculture</b>	<b>6,258</b>	<b>25.05</b>	<b>156,728</b>
Ag Nonproject *	5,272	25.00	131,804
CVP Ag contracts 4/	986	25.29	24,924
<b>Upstream Urban Diverters</b>	<b>824</b>	<b>131.01</b>	<b>107,930</b>
CVP M&I settlement contracts Sac	30	-	-
M&I Nonproject *	642	150.00	96,275
CVP M&I contract Sac 6/	152	76.88	11,656
CVP M&I contract Friant 5/	44	50.55	2,223
<b>Urban Delta Exporters</b>	<b>1,519</b>	<b>246.27</b>	<b>374,156</b>
SWP M&I Project 2/	1,362	271.62	370,004
CVP M&I exchange contracts	71	-	-
CVP M&I settlement contracts SJV	4	-	-
CVP M&I contracts 7/	82	50.55	4,153
<b>Urban In-Delta Diverters</b>	<b>191</b>	<b>51.56</b>	<b>9,827</b>
Delta M&I (not CCWD) *	72	50.00	3,623
CVP M&I contract (CCWD) 8/	118	52.52	6,204
<b>Total, Bay-Delta System</b>	<b>18,975</b>	<b>45.08</b>	<b>855,455</b>

1/ Baseline unit cost includes Restoration Payment

2/ Baseline unit cost is for So. Cal.

3/ Baseline unit cost is for Delta-Mendota and includes Restoration Payment

4/ Baseline unit cost is for Friant-Kern and includes Restoration Payment

5/ Baseline unit cost is for Friant-Kern and includes Restoration Payment

6/ Baseline unit cost is for Folsom-South Canal and includes Restoration Payment

7/ Baseline unit cost is for Friant-Kern Canal and includes Restoration Payment

8/ Includes Restoration Payment

\* Baseline unit costs for ag/urban non project are regional estimates.

Reservoir	Dam	Owner	Stream	Reservoir Area (Acres)	Capacity (AF)
<b>State Water Project Reservoirs</b>					
Oroville	Oroville Dam	DWR	Feather River	15,800	3,537,600
Camp Far West	Camp Far West	DWR	Bear River	2,050	104,500
<b>SUBTOTAL</b>				<b>17,850</b>	<b>3,642,100</b>
<b>USBR/CVP Reservoirs</b>					
Shasta	Shasta Dam	USBR	Sacramento River	29,500	4,552,000
Whiskeytown Dam	Whiskeytown	USBR	Clear Creek	3,200	241,000
Folsom Lake	Folsom Dam	USBR	American River	11,450	977,000
New Melones	New Melones	USBR	Stanislaus River	12,500	2,400,000
Berryessa	Montecello	USBR	Putah Creek	20,700	1,602,000
Beardsley *	Beardsley	USBR	Stanislaus River	650	77,600
Huntington *	Huntington	USBR	South Fork San Joaquin	1,440	89,800
Millerton	Friant	USBR	San Joaquin	4,900	520,000
<b>SUBTOTAL</b>				<b>84,340</b>	<b>10,459,400</b>
<b>USCE Reservoirs</b>					
Black Butte	Black Butte	USCE	Stony Creek	4,560	160,000
New Bullards Bar	New Bullards Bar	USCE	North Yuba River	4,810	966,103
New Hogan	New Hogan	USCE	Calaveras River	4,410	317,100
Eastman Lake	Buchanan	USCE	Chowchilla River	1,780	150,000
Hensley Lake	Hidden Dam	USCE	Fresno River	1,570	90,000
<b>SUBTOTAL</b>				<b>17,130</b>	<b>1,683,203</b>
<b>Other/Local Reservoirs</b>					
Pardee *	Pardee	EBMUD	Mokelumne River	2,134	210,000
Camanche	Camanche	EBMUD	Mokelumne River	7,700	412,120
Lake McClure	New Exchequer	Merced County	Merced River	7,130	1,024,600
French Meadows *	French Meadows	PCWA	Middle Fork American	1,420	136,000
Hell Hole *	Lower Hell Hole	PCWA	Rubicon River	1,250	208,400
Almanor	Canyon	PG&E	North Fork Feather	28,257	1,308,000
Bucks Lake *	Bucks Storage	PG&E	Bucks Creek	1,827	103,000
Salt Springs *	Salt Springs	PG&E	North Fork Mokelumne	975	141,900
Edison *	Vemilion Valley	SCE	Mono Creek	1,890	125,000
Shaver *	Shaver Lake	SCE	Stevenson Creek	2,177	135,400
Lake Lloyd (Cherry Lk) *	Cherry Valley Dam	SF	Cherry Crk/Tuolumne R	1,760	274,300
Hetch Hetchy *	O'Shaughnessy	SF	Tuolumne River	1,972	360,000
Little Grass Valley	Little Grass Valley	SFWPA	South Fork Feather	1,433	93,010
Loon Lake *	Loon Lake	SMUD	Gerle Creek	1,450	76,500
Union Valley *	Union Valley	SMUD	Silver Creek	2,575	230,000
New Don Pedro	Don Pedro	TID	Tuolumne River	12,960	2,030,000
Indian Valley	Indian Valley	YCFCWCD	North Fork Cache Crk	4,000	300,000
Clear Lake	Clear Lake Imp	YCFCWCD	Cache Creek	43,000	313,000
<b>SUBTOTAL</b>				<b>123,910</b>	<b>7,481,230</b>
<b>TOTAL</b>				<b>243,230</b>	<b>23.3 MAF</b>

Data from DWR Website: <http://cdec.water.ca.gov/misc/resinfo.html>;

Legend:

- PCWA: Placer County Water Agency
- SCE: Southern California Edison
- EBMUD: East Bay Municipal Utility District
- YCFC&WCD: Yolo County Flood Control & Water Conservation District
- SFWPA: South Feather Water and Power Agency
- SMUD: Sacramento Municipal Utility District
- COE: United States Army Corps of Engineers
- TID: Turlock Irrigation District